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25 YEAR RE-REVIEW

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SCIENTIFIC EDUCATION

1. Entrance requirements, and degree requirements for science and engineering majors:

a) Entrance requirements:

The higher learning of science and engineering majors is accomplished at the universities, and at special schools of higher education which are of university rank. These schools are governmental institutions and exist in Belgrade, Zagreb, Ljubljana, Skoplje, and Sarajevo. Every Yugoslav citizen who is graduated from the Gymnasium and from the special workers Gymnasium or from the technical school and from the special workers technical school, can enroll at the university. The students who come from the workers technical schools and from the workers gymnasiums can be enrolled only in such departments which correspond to their profession. Until 1950 they could enroll as irregular students if they were in the field at least one year, but some exceptions could be regular students. (See - The Universities and the Schools of Higher Education in FPRY, Univerziteti i visoke škole u FPRY, Belgrade 1950, edited by the Government of FPRY, Council for Science and Culture, pages 1 - 3.) Students, who have the qualifications to enroll at the university but because of their job cannot go regularly to the lectures and to the school exercises can be enrolled by permission of their superiors as irregular students. For irregular students there is a special regime of studies.

The schools from which the students come to the universities and to the schools of higher education are:

- 1) Gymnasiums are the schools of general education. Their learning lasts eight years, four years of a low course and four years of a high course. In the low course pupils are accepted who have four years of elementary school. In the high course students are accepted who are graduated from the low course or from the grade school.
- 2) Special schools for the general education of the workers were established in 1947 for the purpose of giving general education to the workers. These schools last two years. They have a low course and a high course. Workers who have at least elementary school attend the low course. Workers who have at least two years of gymnasium attend the high course. The graduated students from the high course can continue their studies as students at the university (The information manual about Yugoslavia, Informacioni priručnik o Jugoslaviji, edited by the Government of FPRY, Direction for the Information, Belgrade 1948, Page 34).

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- 3) The professional schools, "technicums," are established in many centers. These schools are attended by the students who have four years of the gymnasium. Graduates from these schools can continue their studies at the respective department of the university.
- 4) To the professional schools belong also the workers "technicums" which last two years. These schools can be attended only by these workers who had a professional school apprenticeship or an industrial school education. The graduate students from the workers "technicums" can enroll in the respective department of the university.

The professional school for the apprentice has the purpose of enabling, theoretically and practically, the apprentice and the younger workers to become qualified workers. This school lasts three years. There are also the industrial schools of different branches, which are established within the larger industrial enterprises, (The information manual about Yugoslavia, Pages 227 and 228 - The general instructions on the professional schools, Opšte uputstvo o srednjim stručnim školama, of 9 Sep 49, Law No 626, Gazette Official, No 78, 1949 - The executive order on the workers "technicums," Uzedba o zadnickim Achnikumima, of 4 Nov 47, Law No 701, Gazette Official, No 96, 1947 - the executive order on the courses for the development of the unqualified workers, Uzedba o tečajevima za stručno podizanje nekvalificiranih radnika, of 19 Nov 47, Law No 723, Gazette Official, No 99, 1947.)

b) Degree requirements for science and engineering majors:

Before World War II there existed in Yugoslavia three complete universities: Belgrade, Zagreb, Ljubljana and three separate departments: Subotitsa /Law/, Skoplje /Philosophy/, and Sarajevo /Agriculture and Forestry/. After World War II the Law Department in Subotitsa was abolished, and the departments in Skoplje and Sarajevo were transformed into universities. Skoplje has four departments (philosophy, agriculture and forestry, medicine, engineering) and Sarajevo, six: agriculture and forestry, medicine, philosophy, law, veterinary medicine and engineering. (The Universities and the Schools of Higher Education, pages 250, 263). Also after the war, there were formed, by the separation of the department of philosophy (in Zagreb 1946, in Belgrade 1947, and in Ljubljana 1949) the departments for natural science and mathematics (ibidem, pages 66, 212). Therefore, for science there are two departments (philosophy, and natural science and mathematics) in Belgrade, Zagreb, and Ljubljana, and one (philosophy) in Skoplje, and in Sarajevo. For Engineering there are the technical schools of higher education in Belgrade and Ljubljana, and the department of engineering in Zagreb, Skoplje, and Sarajevo. The course in

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the department of philosophy and in the department of natural science and mathematics lasts four years. The course at the technical school and at the department of engineering lasts five years. The examinations in all these schools are taken by individual subjects. If the course of some subjects lasts more than one year then examinations are given in these subjects insofar as they have been covered. For the less important subjects the faculty can establish a colloquium instead of the formal examination. The system of rating of students is not standardized. In Zagreb the result is graded both by words and by figures: Unsatisfactory (1), Satisfactory (2), Good (3), Very Good (4), and Excellent (5), and grade Unsatisfactory is not passing. At the other universities and at the schools of higher education the rating is graded only by figures: 1 - 10, and grades 1 - 5 are not passing. The final examination is necessary in the department of philosophy and the department of nature and mathematics for the diploma. This diploma examination is taken at the end of the last semester, in the main subject, and it consists of a homework theme, and a written and oral examination, which can be theoretical and practical. The final examination at the technical school of higher education and in the department of engineering consists of the diploma treatise and its defense. The scientific degree of doctor of science which is attained by special provisions, at least two years after a diploma, is established for the purpose of the development of a scientific work, and also for the purpose of developing highly qualified experts in all branches of science (ibidem, page 18). The doctorate can no longer be only an academic and school degree (as it was for example in Zagreb), but a scientific degree, for which the elaboration and defense of a dissertation is required. "The doctor's dissertation is an independent tribute to science. It must represent an independent work. In its result must be the resolve or theoretical explanation of the scientific problems, or set new problems which are of interest to science. The dissertation must elaborate the problem in detail and explain it in connection with the problematics of the respective scientific field." (Law on the obtaining of the scientific degree of doctor of science, Section 6, Zakon o sticanju naucnog stepena doktora nauka, of 12 Oct 48, Law No 765, Official Gazette, No 89, 1948). But it is very interesting that the conferring of this degree is recognized not only by the universities and by the schools of higher education but also by the Academies of Science (ibidem, Section 4). According to the newspapers, the abolishment of this right of the academies is being considered. In the project of the new law on the universities, it is proposed that the degree of doctor of science be conferred only by the universities or the schools of higher education (The American Szobran, Pittsburgh, Pa No 11067, of 23 Feb 54).

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2. Undergraduate curricula of Yugoslav institutions of higher learning:

The curricula of Yugoslav institutions of higher education varies with the purpose of these schools. The aim and the purpose of the universities and of the schools of higher education is as follows:

"The universities and the schools of higher education are the highest governmental institutions for instruction, learning, and education, and for scientific work. Its purpose is to develop highly qualified experts in the different branches of science and engineering, to do scientific-explorer work, and to cooperate in the resolving of the problems of the cultural, economic, and technical development of the country, to form and develop the progressive scientific thought, to educate and instruct the students on the basis of the learning of Marxism - Leninism, and to develop in them the love and the devotion to the socialistic homestead of FPRY and also to the deed of the socialism in general, and to bring the scientific and technical knowledge to the working masses of the Yugoslav peoples." (The universities and the schools of higher education, page one). By reason of this, it was established at all faculties and for every student the obligatory study of Marxism - Leninism, and "the acquainting of the Marxistic - Leninistic science, of the laws: of the development of the proletarian revolution, of the development of socialism, of the victory of Communism." Also there is established the premilitary instruction during the whole study time, as a continuation of this instruction in the high school. In the aim of the linking of the studies at the universities and at the schools of higher education with the practice in the production and in the institutions, there was established, in 1948, for the regular students, as the component part of their studies, the obligatory practice of at least one month which is performed during the summer's vacation. The obligatory practice is performed in the governmental agencies, institutions, and enterprises, with the scientific and professional teams, at the public works, at the public farms, in the farmers working cooperatives, in the shipyards, on boats, and in other similar institutions. The program for the work in the practice is determined by the council of the department, in agreement with respective governmental departments under whose jurisdiction the practice shall be performed. The practice is performed under the instructive management and control of the faculty and under the direct professional management of the organization unit where the practice is performed (ibidem, page 16). In a parallel way with the changes of the formation of the universities and of the schools of higher education there followed different changes in learning plans. Universities and schools of higher education have to satisfy the needs of the new economic and social life. For this reason and conforming to these needs, the learning plans are changed many times. There were also changes of these plans in their accomplishments. All universities could not realize the same learning plan but realized it in proportion to their possibilities. The same was true

of the learning program. The regulation of the materials which must be given to the students as the student's standard professional knowledge, passed through the different changes. Also this program could not be introduced equally in all school centers (ibidem, page 17). The learning plan for the department of philosophy, which was fixed in 1949, is not yet standardized at all universities (ibidem, page 18). "At the faculties of law the content of the learning was changed after the war in harmony with the social and political changes in the country. Before the faculties of law is set as the purpose to form a new lawyer, who shall be the fighter for the development of socialism in his country. All this was possible only if the learning was placed on the basis of the Marxistic-Leninistic conception of the state and of the law. It was necessary to add to the new learning plan also the whole system of the socialist new public order, that the students should get the general theoretical basis for the study of science of law, on the one part, and on the other part that the students should be acquainted in the most possible measure with the problems of the new social reality and the new positive law." This is the reason that the learning plan was modified a few times. "The changes of the former program consisted in principal in the introduction of new subjects as general history of the state and law, history of the people's authority, history of the political doctrines, Marxism-Leninism. It enlarged also the general economic education of the lawyers by the introduction of the lecture of the political economy and of the economy of Yugoslavia. At the faculties of law a particular specialization in the school year 1946-1947 was established, that is the judiciary and the political-administrative branches, which are divided in the fourth year of the study. But, these specializations were abolished in the learning plan for 1947-1948 (ibidem, pages 27-28). Also Marxism-Leninism was abolished as an individual subject in 1952 and this subject is now included in the National Economy and the Political Economy. The learning of the basic laws of the dialectic and historical materialism is the purpose of the gymnasiums and the other schools of general education (The Resolution of the III Plenum of the Central Committee of the Communist Party of Yugoslavia About the Purpose of the Schools, The Struggle, Borba, the organ of the KPY, of 3 Jan 50). Tuition is free, but the students must regularly attend all obligatory subjects and exercises, and take the examinations on the prescribed terms, otherwise they lose the right for further study (The universities and the schools of higher education, page 11).

3. An account of how curricula, entrance, and degree requirements are determined and changed:
 - a) All laws and legal provisions, enacted prior to 6 Apr 41, were abolished, that is those provisions which were in force at the time of the German attack on Yugoslavia in World War II ("All Provisions: laws, executive orders, orders, regulations, etc, which were in force 6 Apr 41, have lost their legal power," Law

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abolishing Provisions of Law Enacted Prior to 6 Apr 41, and those enacted during the Occupation by the Enemy, Zakon o nevaznosti pravnika propisa donesenih pre 6 Apr 41, i za vreme neprijateljske okupacije, of 23 Oct 46, Law No 605, Gazette Official, No 86, 1946). However, some legal provisions of the abolished laws continued in use, until the enactment of new provisions, and that was expressly ordered by this derogatory law: The legal provisions, which are contained in the abolished laws can be adjusted further on the circumstances which are not yet regulated by the new provisions, inasmuch as they are not in contrariety with the provisions and principles of the new constitutional and legal order (ibidem, Section 4, Paragraph 1). In this way the legal provisions on the universities remained in use. Later, the Executive Order creating Technical Schools of higher education expressly referred to these provisions pertaining to the school organization and school work (The Basic Executive Order on the Separation of the Technical Departments of the Constitution of the Universities and of Transformation of these Departments into Technical Schools of Higher Education, Osnovna uzedba o izdvajanju Aehnickih fakulteta iz sastava universiteta i o njihovom pretvaranju u Tehnicke visoke skole, of 1 Jul 48, Law No 466, Gazette Official, No 58, 1948). According to the sense of these former provisions (but in harmony with the new order) university life was renewed after the war, and the work of the faculties started again. These old provisions are still some kind of basis for the work of the universities.

- b) Of the new provisions there exist teaching regulations enacted by the federal government for each department. By these teaching regulations, the number of years of study for the respective department are fixed, the sections of the department, the diploma examination. The teaching plan in detail is ceded to the States. The states are given the right to open sections and branches in the departments according to needs and potentialities. Teaching regulations were enacted progressively and more or less as the result of interdepartmental conferences and decisions (The universities and the schools of higher education, Page 16). For some departments teaching regulations were later changed and replaced by new ones, and for other departments these regulations were permanent. Chronologically, the first regulations were enacted for the teaching at the technical departments, Pravilnik o nastavi na tehnickim fakultetima, of 23 Aug 46 (Law No 493, Official Gazette, No 69, 1946). Later, came regulations for the teaching at the Economic-Commercial schools of higher education, Pravilnik o nastavi na Ekonomsko-Komercijalnim visokim skolama i ekonomskim fakultetima univerziteta, of 27 Sep 46 (Law no 562, ibidem, No 79, 1946). Those Regulations were revoked after two years, and new ones enacted on 25 Oct 48 (Law No 805, ibidem, No 95, 1948).

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- 1) For the department of law the regulations were enacted on 14 Oct 46, (Law No 590, *ibidem*, No 84, 1946). Those regulations were replaced by the new ones on 25 Oct 48 (Law No 804, *ibidem*, No 95, 1948).
 - 2) For the department of Medicine the regulations were enacted on 15 Oct 46 (Law No 609, *ibidem*, No 86, 1946), succeeded by the new regulations on 8 Aug 48 (Law No 586, *ibidem*, No 69, 1948). (The first provide that the learning last six years, the second five years).
 - 3) For the department of veterinary medicine the regulations were enacted on 8 Oct 47 (Law No 641, *ibidem*, No 88, 1947).
 - 4) For the department of agriculture and forestry the regulations were enacted on 11 Dec 47 (Law No 816, *ibidem*, No 109, 1947).
 - 5) For the department of natural science and mathematics the regulations were enacted on 10 Sep 48 (Law No 684, *ibidem*, No 80, 1948).
 - 6) For the department of pharmacy the regulations were enacted on 5 Jan 49 (Law No 22, *ibidem*, No 4, 1949).
 - 7) For the department of philosophy the regulations were enacted on 28 Mar 49 (Law No 300, *ibidem*, No 35, 1949).
- c) The states provided for each department a concrete teaching plan, and opened sections, according to their special needs and teaching possibilities (The Universities and the Schools of Higher Education, Page 16). Besides the teaching plan the states can include in their regulations everything concerning the work of a department. The Government of the State of Croatia, for example, enacted, on 14 Aug 52, regulations on the organization of the teaching at the department of Medicine in Zagreb, Uzedba o organizaciji nastave na Medicinskom fakultetu u Zagrebu (Official Gazette of Croatia, Nazodne novine, No 40, 1952), in which it provided: the purpose of the department, the method of the realization of this purpose, the subjects, the auxiliary institutions, the time of study, the teaching plan by semesters, the exercises in the clinics and in the institutes of the department the right of enrolling, the passing of another department, the examinations. The states can establish new departments at the universities and the schools of higher education. Of this character are the following regulations of the State of Serbia: Executive Order of the establishment of the agricultural department and of the department of forestry, Uzedba o osnivenju poljoprivrednog i sumarskog fakulteta, of 5 Feb 49 (Official Gazette of Serbia, No 6, 1949), and Executive Order of the establishment of the Geological faculty, Uzedba o osnivanju Geoloskog fakulteta, of 27 Sep 49 (*ibidem*, No 43, 1949).

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d) All these provisions, which are in force expressly or implicitly, and all this system of the school regulations federal or state, will depend upon the future law on the universities and on the schools of higher education. This law was in preparation a few years, and it has two-three variants of its draft up until the present time (Message, Poruka, London, UK, American Szoboran, Pittsburgh, Pa, of 23 Feb 54). Its fundamental provisions shall be a basis for the future federal jurisdiction and state jurisdiction on the problems of the institutions of higher education. There is no data about the main principle of this future new law on the universities. But, it is considered as certain that the universities will not have any scientific autonomy and their professors shall not be at their school job constant and unremovable (Message, Poruka).

4. A list of textbooks used especially in science, engineering, and economics:

There is not enough data on textbooks in general, and for the data that exists there is considerable difference of opinion. For example, it is noted in the Yugoslav press as a great success that the university in Belgrade, until the end of 1948, edited, lithographed scripts (The voice, Glas, of 21 Dec 48, Page 3). However, in the Resolution of the III Plenum of the Central Committee of the Communist Party of Yugoslavia about the purpose of the Schools is said: The number of textbooks is insufficient. The translated textbooks have many defects, especially the textbooks of social science. It is necessary to mobilize the best scientific forces to create as soon as possible their own textbooks in all social science. The same applies to the textbooks of natural science. For teaching at the institutions of higher education it is necessary to continue to translate the best textbooks, especially the textbooks of natural science (The Struggle, Borba of 3 Jan 50). But it can be believed that the textbooks of science and engineering are of a satisfactory level, because Yugoslavia had good scholars in this scientific field. The Government stimulates this work with its annual reward. For example, for 1949 the reward was conferred on construction of the railroads; the chemistry (four volumes), the introduction in the higher analysis, the elements of the construction of steel and the steel construction of buildings, the higher mathematics (The information manual about Yugoslavia, Page 252). Concerning economics there are also many scholars and writers of solid knowledge and of good reputation. But, they cannot express themselves fully, because the teaching of Marxism-Leninism and the Communist indoctrination is of primary importance. This is the reason that the teaching of economics is not always high in the scientific sense. The economic textbooks were translated from the Russian language. The professors with the important influence in this work did not have sufficient qualifications. For example, a professor of economics at the university in Belgrade, 1945-1948, Mirko Markovich, a naturalized US citizen, during World War II editor of the Communist paper "Slobodna Rec" (The Free Word), in Pittsburgh, Pa, former participant

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in the Spanish civil war in the ranks of the Communist International brigade, whose school qualifications for this professor's job were four years of elementary school in Montenegro, Yugoslavia, and a short Communist propaganda course in Moscow, USSR, lost this job after 1948. This happened not because he was incapable of being a professor of the university, but because he agreed with the Cominform in the Cominform - Tito collision in 1948, and as a consequence of this attitude he was deprived of all his positions, both political and social.

5. A comparison of the above four elements with corresponding elements in US education:



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The Yugoslav pre-university schools were, until World War II, probably part of a larger program than the respective US schools. Now those schools certainly are not of this rank. The workers' gymnasiums and the workers' "technicums" are very poor. By noting the entrance requirements, the length of time of study, the results, it appears that these schools failed to achieve US standards. Concerning the university and the schools of higher education, these institutions surely were not below the respective US schools either by the scientific height of the teachers and of the teaching or by the success. The university had its academic freedom, and had the independence of their teaching and learning work. The professors of the university were elected by the university teachers corps, not employed by the power of government. And, without their consent, they could not be employed in any other work or transferred to another university or another department (Section 20 of the Law on Universities, of 28 Jun 30). Now, the universities did not have this autonomy. This is the reason the quality of the school work is inferior not only to the US school work but also inferior to the same work in former Yugoslavia.

6. A comparison of leading Yugoslav institutions of higher education, pointing up differences among them, both statistically and qualitatively:

The universities in Belgrade and in Zagreb can be considered as leading Yugoslav institutions of higher education, in an academic sense. But to determine this leading rank one must take into consideration not only the size and development of these institutions, but also the ethnic structure of Yugoslavia. The principal ethnic components of Yugoslavia are the Serbs, the Croats, and the Slovenes. And the respective school, scientific, and spiritual centers of these components are Belgrade, Zagreb, and Ljubljana. Therefore, beside the university in Belgrade which is the Serb center (though Belgrade is also the metropolis of the whole Yugoslavia), and beside the

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university in Zagreb which represent the Croats, must also be added the university in Ljubljana as the representative of the Slovenes (in these three centers are also the three respective Academies of Science). The university in Skopje and in Sarajevo, are young institutions, still in the formative period, not yet entirely completed. In view of the number of students, the university in Belgrade stands in first place. In the 1948-1949 school year it had 17,072 students, and in the 1949-1950 school year 16,524 students. In this number are not included students of engineering and students of medicine, because the engineering department and the department of medicine already existed as separate schools of higher education. If we deduct the engineering students and the students of medicine for comparison (in spite of the fact that Zagreb did not have separate technical or medicine schools of higher education), in the school year 1948-1949 the university in Zagreb had 8,633 other students, and in the school year 1949-1950 had 8,602 other students. The university in Ljubljana, in the school year 1948-1949 had 4,711 students, and in the school year 1949-1950 had 4,755 students (not included in this number are the engineering students and medical students who already had at this time their separate schools). If we state comparatively in all these three centers the total number of the students, not deducting the engineering students and medical students (because they are still in the constitution of the university in Zagreb and in Belgrade and in Ljubljana were just separated), the picture is as follows:

Belgrade	1948-1949: 30,095	1949-1950: 28,510
Zagreb	1948-1949: 15,479	1949-1950: 15,402
Ljubljana	1948-1949: no data	1949-1950: 7,418

(For the 1948-1949 school year the data of the Information Manual, pages 228, 229. For the 1949-1950 school year the data of the Universities and the Schools of Higher Education, pages 66a, 149, 211.)

Qualitatively, comparison could be made by the success of the students at the individual universities, and by the reputation which the individual universities have. For the first element there is no data. For the second element the university in Belgrade had the priority. Before the uniting of Yugoslavia, the university in Ljubljana did not exist. Created in 1938, it was only in the primary phase of its development between World War I and World War II. The university in Zagreb, which existed before the uniting of Yugoslavia and which is chronologically older than the university in Belgrade, did not develop to a favorable condition during the Austrian regime. The university in Belgrade, which originated in Serbia, developed itself in other traditions. It had freedom of teaching and freedom of scientific work. It had its academic autonomy, which the university in Zagreb attained only under united Yugoslavia. Besides

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this, the examination in Belgrade was programmatically more rigorous and more extensive. The doctor's examination was regulated by the provisions which are not in force for other universities, and by requirements which gave full authority to the doctor's degree. This was the reason that the doctorates in Belgrade were in a very restricted number, but in Zagreb the doctorate was quite a usual thing (for example, almost every student graduate of law was a doctor of law). This difference existed until 1935.

7. Provide an account of the number and nature of research projects in universities. Is it believed that such projects can be carried rapidly over to the development stage? What obstacles exist? What are the favoring factors?

From the incomplete material, one concludes that true research projects did not exist at the universities and at the schools of higher education in Yugoslavia. The institutes, the laboratories, the cabinets, and the seminars which are in the official information publications numbered under a headline "The Teaching and the Scientific Institutions" (The Universities and the Schools of Higher Education, pages 70-74, 76-79, 86, 88-91, 93, 94, 97-99, 105-110, 112-114, 124, 159, 161-163, 165, 166, 169-172, 174, 177, 184-189, 192-194, 201-208, 215-219, 221, 222, 227-243, 245-246, 252-255, 257-259, 261, 267, 268, 270-272), are dedicated in the strict sense more to the school work and school exercises than to scientific research. There are over 600 such institutions, including the clinics of medicine. Of this number a few institutions had a team of excellent quality for scientific work. But perhaps even in these cases, it could not be said that they were research projects. If we consider the publications of this work, the results are very limited. The reason for this situation is, first of all, the fact that the chiefs of all these university institutes are much absorbed by the direct school work (lectures, the exercises with students, examinations, etc.), and they cannot always dedicate themselves to full scientific work because the number of teachers is insufficient for so great a number of students. Secondly, the equipment of these institutes is too modest, because many needs appeared at the same time for the establishment of new universities and new schools of higher education. Besides, the war almost entirely destroyed some institutions. Especially the university in Belgrade suffered very much. (Information Manual About Yugoslavia, Page 66) "Directly before leaving Belgrade, the Germans set fire to the new building of the university, and burned it. In this building were two institutes of the philosophy department and 30 institutes of the agricultural-forestry department. At the technical department 13 institutes, two museums, and the library were destroyed by the bombardment. At the department of medicine five institutes were destroyed" (ibidem, page 50). "Of the total number of 174 different institutes, seminars, and the laboratories of the university in Belgrade which existed at the beginning of 1941, 72 were destroyed completely, with all equipment, 58 were heavily damaged, with a 50 percent loss of equipment, including the most prized and indispensable collections, books, and instruments; 48 institutes suffered less damage." (ibidem, page 228). "The technical and medical departments in Zagreb and the

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medical department in Ljubljana were seriously damaged. The law department in Subotitsa and the philosophy department in Skoplje practically did not exist after the war." (ibidem, page 30). But, according to the belief in the country, the institute in the village Vincha near Belgrade is considered a true research project. Public opinion believes this institute does atomic study and atomic research. The director of this institute is Paul Savich, professor of Physical Chemistry at the university in Belgrade, former pupil and assistant of Irene Joliot-Curie in Paris. Until World War II professor Savich was almost unknown in Yugoslavia, but now he has all the honors, both scientific and political: he is professor of the university, member of the Academy of Science in Belgrade, member of the Academy of Science in Zagreb (The Material About the Scientific Institutions pages 10, 24), Representative of Yugoslavia. Evidently the government expects great results from him and from his research.

8. A statement regarding the relations of industrial management with university research: Is there financial cooperation, assistance, etc.?

Based on limited data the following observation can be made:

If some research at the universities is developed, and if some link exists in this work between the university and the industry this is not cooperation as in the US. The reasons are the following:

- a) Yugoslavia was, until the end of World War II, mostly an agricultural country without developed industry. Especially it was without any great industry of powerful financial means. This is the reason that industry does not give serious support to scientific research.
- b) Another unfavorable element is that private initiative no longer exists in the development of industry. Insofar as a modest industry existed, it was nationalized after World War II, and in the present social-economic order of Yugoslavia it no longer exists as private property.
- c) The nationalized industry has its factory buildings and factory equipment as its investment capital, and its trade capital is received from the Bank of Yugoslavia as part of the quota of the directed credit system. These funds cannot be turned over to a university.
- d) All schools in Yugoslavia are governmental (article 38 of the Constitution), which precludes private cooperation with industry. The school management and the management of industry has the same supreme chief; the Government. The industry's enterprises are given to the workers for management, but the manager, who has the principal word in an

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enterprise, is employed by the Government, not by the workers' management. If the universities are to do research, it depends on the Government and on the means which the Government has placed by the budget at the disposition of the universities for this purpose. Further, the Government has to decide the extent of cooperation of the industry in this work, insofar as the industry can accumulate in this system of economics the pecuniary and technical means for that cooperation. Also in the case of procurement of these means for that cooperation, it is not certain that they will not continue to allocate to other needs, as it has happened now. According to the press, the Yugoslav Government intends to take 50 percent of the reserve of the accumulation in the industry in the last year as a compulsory internal Governmental loan (C.F.: 9 Mar 54).

- e) Even if Government procures the means to the universities and to the industry for research, and even if they come to a mutual cooperation in this work, it still cannot be said that it is the same type of cooperation as is understood in the US. In the US it is the collaboration of two free and independent institutions, but in Yugoslavia there is always only one factor: the government, which decides about everything, and which can determine the collaboration and the cooperation or not determine, and which in this concrete case directs the schools, the industry, the Bank of Yugoslavia, the monetary means, in general, everything.

9. the quality of the instructing staffs, of the administration of higher education, of the caliber of the students:

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- a) The instructing staff of the universities has changed since World War II. Any teacher who is considered inept by the Communist regime is discharged. Even though some discharged teachers have been eligible for a pension, some teachers have been deprived of this right. From the Official Gazette of Serbia No. 33, 13 Oct 45, it is evident that the University of Belgrade has been deprived of a number of teachers of good reputation. Almost every "undesirable" teacher was well-known domestically and abroad for his scientific work and was a member of domestic and foreign academies of science. Moreover, a few teachers who were invited to the staff of the University of Belgrade were afterwards removed from the university, for their attitude was not in harmony with "our socialistic reality" or that their teaching was not in accord with "the historic and materialistic dialectic." Such teachers also had the good academic and scientific qualification. Among the new teachers were a few with entirely contrary qualifications. The instructing staff on an average is sufficiently qualified for their teaching and learning function. There is never enough scientific independence, especially in social-political problems. For example, in Constitutional Law the leading

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professors in Belgrade, Zagreb, and Ljubljana formed their opinions about some theoretical questions not by true scientific analyses but by the attitude which the government took in the Constitution of 1946 and 1953. These professors supported collective state chiefship and invented many advantages over the individual state chiefship as long as the Constitution of 1946, which provided the collective state chiefship under the name of Presidium of National Assembly, was in force. After the change of the Constitution in 1953 and after the establishment of the President of the Republic as the individual state chiefship, they no longer mentioned the collective presidium and its advantages but wrote in behalf and in praise of the individual presidency. On the problem of sovereignty of the individual components, the same professors theoretically answered affirmatively while it was so provided in the Constitution of 1946, but they declared this conception absurd under the Constitution of 1953.

b) Quality of the administration of higher education:

In the beginning, the Ministry of Education administrated schools. Later, this Ministry was abolished and substituted by a Council of Schools which was responsible for regulations governing teaching. The president of this Council had the title of Cabinet Minister. Later, a Ministry of Science and Culture existed. Now the schools are under the jurisdiction of a federal Executive Order. Insofar as the school administration belonged to the states, this administration was under the jurisdiction of the State Ministry of Education. When the states did not have a special ministry of education, the school administration was under a council for science and culture. A definitive division of this jurisdiction between the federation and the states is not yet clear (the Resolution of the III Plenum of the CC of KPY about the schools, The Struggle, Borba, the organ of KPY, 3 Jan 50). The character and the quality of school administration, particularly the administration of the schools of higher education, depends primarily on the present purpose of the Yugoslav school. One of the essential and principal purposes of all schools, beginning with the elementary schools, is to lead the youth spiritually into Communist doctrine, and to tie the youth firmly with the Communist ideology. This is also one of the essential purposes of the universities. The quality of the school of higher education goes parallel with this purpose of these schools. This quality is predestined by the above purpose in selection of the instructing staff of the universities. In the same way is the subsequent removal of such teachers who are not in accord with the "socialistic reality." For this purpose the "Marxism-Leninism" was decided as the obligatory subject for all students and for all departments. This is the principal explanation why the universities do not have academic freedom of scientific work and do not have their autonomy. This is the reason why the law on the universities is not yet enacted. One must look at the

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picture of the school administration and of its quality through these elements. The school administration is still principally absorbed in bolshevizing of the new generation, and all other problems for the school administration are secondary.

c) Quality of the caliber of the students:

In the first years after World War II, students with Communist allegiance were favored. The enrollment applications of those students with unfavorable "characteristic" were usually refused under the pretext that the number was already completed. Communist youth had the principal word in all students' problems and in education. These youth gave opinions about the teachers and a few professors lost their jobs by reason of such opinions. Intellectuals among the Communists during World War II were almost all undergraduate university students. But by the end of the war many of these students returned to their studies. Further, many students from the workers' ranks through the workers' gymnasiums and the workers' "technicums" came to the universities. These schools gave an incomplete and defective pre-university education, and the students followed with difficulty the teaching and the university program. Too often they were a school obstacle. They received their diplomas but were not capable for professional work. By reason of this difficulty, the university entrance examination for the school year 1951-1952 was established but was not continued. The federal Executive Council enacted, on 2 Sep 53, a decision on the right of the graduate students of the schools for general education to the entrance at the university (Law No. 290, Official Gazette, No. 34, 1953), by which every graduate student of these schools has the right to enroll in each department without limitation. A similar decision was enacted, on 7 Sep 53, for the graduate students of the professional schools who practiced two years after school, Law No. 295, Official Gazette, No. 35, 1953. Therefore, the quality of the caliber of the students is not yet on the necessary level.

10. Do university students manifest enthusiasm for the hard work necessary to exploit Yugoslavia's resources? It has been reported they dislike to give up urban life for the more isolated life involved in development projects. Is this a serious hindrance to development of the country's resources?

According to the Yugoslav press, the graduate students indeed avoided going to work outside of the cities. Certainly one of the reasons for that is the low conditions of life in the country. But there can be other reasons. The development projects are in reality the development of Communism. All these projects are a part of the plan for Communizing the country. It is natural that a passive resistance against this still exists. One part of this resistance probably is the abstinence of work. However, this abstinence does not represent a serious hindrance to the Government's plans because it did not include all students and their work was not absolutely

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necessary. Forced labor, directly or indirectly, exists also. The reason the failure of the Government's projects is in the imperfection of the plans and in its modifications and experiments.

11. What is the present status of Yugoslav science? How is it supported financially? What part do scientific societies play?

The regime demonstrated extreme interest for the scientific work, both for the individual scientific workers and for the scientific societies. Particularly, the regime interested itself with the work of the Academies of Science, which are the most active of all scientific societies.

- a) There are three Academies: In Zagreb, in Belgrade, and in Ljubljana. Except for the Academy in Ljubljana, which was just as the beginning of its work before World War II (it was established in 1938), the other two Academies already had the reputation and the rank of serious scientific institutions. After World War II the work of all three Academies was renewed, but under new circumstances, and under the new laws which are of State character. On the Academy Serb in Belgrade the law was enacted on 30 Jun 47 (Official Gazette of Serbia, No. 30, 1947), and on 5 May 48 the regulations about its institution were enacted (ibidem, No. 27, 1948). On the Academy in Zagreb the law of 9 Dec 47 is in force, and on the Academy Slovene in Ljubljana the law of 21 May 48, amended on 11 May 49 (The Material on the scientific institutions and the magazines in the FPRY, Materijal o naucnim ustanovama i casopisima u FPRY, edited by the Government of the FPRY, Department of Science and Culture, Belgrade, Mar 50.) The budget of the Academies is included in the state budget. The budget of the Academy in Belgrade in 1949 amounted to 114,979,000 dinars, and in 1950 amounted to 167,961,000. The budget of the Academy in Zagreb in 1948 amounted to 34,975,700; in 1949 to 59,970,000; and in 1950 to 71,885,000. The budget of the Academy in Ljubljana was 3,611,580 in 1947; 9,548,380 in 1948; 15,995,840 in 1949; 12,725,000 in 1950 (ibidem, Pages 6, 16, and 26).

Moreover, there are also individual benefits to the members of the Academies and to other scientific workers.

So the Decision of the Presidentship of the National Assembly of Serbia on the extraordinary beneficial allocation to the members of the Serb Academy in Belgrade and to the professors of the university, of 4 Oct 45 (Official Gazette of Serbia, No. 36, 1945) was enacted. After this there was enacted the Order on the establishment of a special prize to the members of the Serb Academy on 19 Feb 48 (Ibidem, No. 14, 1948).

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The federal government enacted the Decision on the permanent monthly allocation to scientific workers, on 24 May 46 (Law No. 312, Official Gazette, No. 1946), and the Order on income tax exemption of this allocation, on 6 Aug 46 (Law No. 511, ibidem, No. 71, 1946).

And also there are the Regulations on the establishment of the prize of the Government of FPRY "to the meritorious workers in the field of science and culture," of 13 Jan 49 (Law No. 42, ibidem, No. 6, 1949).

In spite of the fact that the Academies have today some members whose names are absolutely unknown in science, the work of the Academies is very intensive. The scientific and literary production of the Academies is large in all branches (Yugoslav bibliography, from 1948 - 1952).

A considerable number of these elaborates concern the problems which are of interest in the socialistic development of Yugoslavia (The Material, Page 6).

But each Academy works in the territory of its state, not including whole scientific problems of the entire country, and there appeared the need of their closest cooperation. For the coordination of the work of the Academies, the Council of the Academies (The Executive Order on the establishment and jurisdiction of the Council of the Academies of FPRY, Uredba o osnivanju i delokrugu rada Akademijaskog Saveta, of 29 May 48, Law No. 365, Official Gazette, 1948, and the amendments of this Executive order of 23 May 49, Law No. 380, ibidem, No. 45, 1949, the Material) was established.

The Council of the Academies got the role of the highest scientific and cultural institution. Its purpose is to accommodate and to unite the work of all Academies, to give opinions on scientific problems, to initiate the scientific explorer's work for all Academies. The Council is under general control of the Government of FPRY. Its budget is included in the federal budget. In 1948 the budget of the Council amounted to 26,520,000 dinars. (The Material, pages 1, 2)

The scientific work is under the supreme supervision of the government. For this reason, some scientific institutions can be excepted by the decision of the Prime Minister under the jurisdiction of the Council of the Academies (Section 1 of the Executive Order of 23 May 49). The Prime Minister has the right not to approve the election of the executives of the Council (Section 2, ibidem). The chief of the secretariat of the Council is elected by the Council but employed by the

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Cabinet Minister of Science and Culture with the consent of the Prime Minister (Section 4, ibidem).

- b) Concerning other scientific societies and scientific institutions, their work is of more modest quality and more modest size.
12. What significant changes in Yugoslav scientific research and development are likely within the next five years?

If the work of the Academies continues with the recent tempo, it shall be very abundant in the following five years. But it is not possible to say that there will be some significant results from their scientific research. At present, the individual new institutes of the Academies, which passed their first organizational phases, give some scientific production which can be of interest. For example, in the Serb Academy in Belgrade, the Machine Institute, and the Institute of Telecommunications, and in the Slovene Academy in Ljubljana, the Institute of Chemistry (The Material, Pages 4-6). The government interests itself much more for the development of the work of the Academies than for the scientific work of the universities (for this reason there appeared some kind of jealousy on the part of the universities against the Academies). But, the scientific work of the universities develops successfully, in spite of this that they work, in general, with smaller means under less favorable conditions than the Academies. This work also shall be of large production within the next five years, but of what importance it cannot be said now.

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